IN THE CLAIMS:

Please amend the claims as follows:

1. Cancelled.
2. Cancelled.
3. Cancelled.
4. Cancelled.
5. Cancelled.
6. Cancelled.
7. Cancelled.

8. (Original) An isolated nucleic acid molecule encoding a mutant or variant ion channel subunit wherein a mutation event selected from the group consisting of the mutation events set forth in the following Table:

| Subunit Gene | Exon/Intron | DNA Mutation |
|---|---|---|
| SCN1A | Exon 5 | c664C→T |
| SCN1A | Exon 8 | c1152G→A |
| SCN1A | Exon 9 | c1183G→C |
| SCN1A | Exon 9 | c1207T→C |
| SCN1A | Exon 9 | c1237T→A |
| SCN1A | Exon 9 | c1265T→A |
| SCN1A | Exon 21 | c4219C→T |
| SCN1A | Exon 26 | c5339T→C |
| SCN1A | Exon 26 | c5674C→T |
| SCN1B | Exon 3 | c254G→A |
| SCN2A | Exon 6A | c668G→A |
| SCN2A | Exon 16 | c2674G→A |
| SCN2A | Exon 17 | c3007C→A |
| SCN2A | Exon 19 | c3598A→G |
| SCN2A | Exon 20 | c3956G→A |
| SCN2A | Exon 12 | c1785T→C |
| SCN2A | Exon 27 | c4919T→A |
| SCN1A | Intron 9 | IVS9-1G→A |
| SCN1A | Intron 23 | IVS23+33G→A |
| SCN2A | Intron 7 | IVS7+61T→A |
| SCN2A | Intron 19 | IVS19-55A→G |
| SCN2A | Intron 22 | IVS22-31A→G |
| SCN2A | Intron 2 | IVS2-28G→A |
| SCN2A | Intron 8 | IVS8-3T→C |
| SCN2A | Intron 11 | IVS11+49A→G |
| SCN2A | Intron 11 | IVS11-16C→T |
| SCN2A | Intron 17 | IVS17-71C→T |
| SCN2A | Intron 17 | IVS17-74delG |
| SCN2A | Intron 17 | IVS17-74insG |

| | | |
|---|---|---|
| CHRNA5 | Exon 4 | c400G→A |
| CHRNA2 | Exon 4 | c373G→A |
| CHRNA3 | Exon 2 | c110G→A |
| CHRNA2 | Exon 4 | c351C→T |
| CHRNA2 | Exon 5 | c771C→T |
| CHRNA3 | Exon 2 | c159A→G |
| CHRNA3 | Exon 4 | c291G→A |
| CHRNA3 | Exon 4 | c345G→A |
| CHRNA2 | Intron 3 | IVS3-16C→T |
| CHRNA3 | Intron 3 | IVS3-5T→C |
| CHRNA3 | Intron 4 | IVS4+8G→C |
| KCNQ2 | Exon 1 | c204-c205insC |
| KCNQ2 | Exon 1 | c1A→G |
| KCNQ2 | Exon 1 | c2T→C |
| KCNQ2 | Exon 8 | c1057C→G |
| KCNQ2 | Exon 11 | c1288C→T |
| KCNQ2 | Exon 14 | c1710A→T |
| KCNQ2 | Exon 15 | c1856T→G |
| KCNQ2 | Intron 9 | IVS9+(46-48)delCCT |
| KCNQ3 | Intron 11 | IVS11+43G→A |
| KCNQ3 | Intron 12 | IVS12+29G→A |
| GABRB1 | Exon 5 | c508C→T |
| GABRB1 | Exon 9 | c1329G→A |
| GABRB1 | Exon 8 | c975C→T |
| GABRG3 | Exon 8 | c995T→C |
| GABRA1 | 5' UTR | c-142A→G |
| GABRA1 | 5' UTR | c-31C→T |
| GABRA2 | 3' UTR | c1615G→A |
| GABRA5 | 5' UTR | c-271G→C |
| GABRA5 | 5' UTR | c-228A→G |
| GABRA5 | 5' UTR | c-149G→C |
| GABRB2 | 5' UTR | c-159C→T |
| GABRB2 | 3' UTR | c1749C→T |
| GABRPi | 5' UTR | c-101C→T |
| GABRB1 | Intron 1 | IVS1+24T→G |
| GABRB1 | Intron 6 | IVS6+72T→G |
| GABRB1 | Intron 7 | IVS7-34A→G |
| GABRB3 | Intron 1 | IVS1-14C→T |
| GABRB3 | Intron 7 | IVS7+58delAA |
| GABRD | Intron 6 | IVS6+132insC |
| GABRD | Intron 6 | IVS6+130insC |
| GABRD | Intron 6 | IVS6+73delCGCGCCCACCGCCCCTTCCGCG |
| GABRG3 | Intron 8 | IVS8-102C→T |

has occurred.

9. (Original) An isolated nucleic acid molecule encoding a mutant or variant ion channel subunit as claimed in claim 8 wherein a cDNA derived therefrom comprises the sequence set forth in one of SEQ ID NOS: 1-72.

10. (Original) An isolated nucleic acid molecule encoding a mutant or variant ion channel subunit as claimed in claim 8 wherein a cDNA derived therefrom has the sequence set forth in one of SEQ ID NOS: 1-72.

11. (Currently Amended) An isolated nucleic acid molecule encoding a mutant or variant ion channel subunit as claimed in ~~any one of claims 8 to 10~~ claim 8, wherein said mutation event disrupts the functioning of an assembled ion channel so as to produce an epilepsy phenotype.

12. (Currently Amended) An isolated nucleic acid molecule encoding a mutant or variant ion channel subunit as claimed in ~~any one of claims 8 to 10~~ claim 8, wherein said mutation event disrupts the functioning of an assembled ion channel so as to produce one or more disorders associated with ion channel dysfunction, including but not restricted to, hyper- or hypo-kalemic periodic paralysis, myotonias, malignant hyperthermia, myasthenia, cardiac arrhythmias, episodic ataxia, migraine, Alzheimer's disease, Parkinson's disease, schizophrenia, hyperekplexia, anxiety, depression, phobic obsessive symptoms, neuropathic pain, inflammatory pain, chronic/acute pain, Bartter's syndrome, polycystic kidney disease, Dent's disease, hyperinsulinemic hypoglycemia of infancy, cystic fibrosis, congenital stationary night blindness and total colour-blindness.

13. (Currently Amended) An isolated nucleic acid molecule encoding a mutant or variant ion channel subunit as claimed in ~~any one of claims 8 to 10~~ claim 8, wherein said mutation event disrupts the functioning of an assembled ion channel so as to produce an epilepsy phenotype when expressed in combination with one or more additional mutations or variations in said ion channel subunit genes.

14. (Currently Amended) An isolated nucleic acid molecule encoding a mutant or variant ion channel subunit as claimed in ~~any one of claims 8 to 10~~ claim 8, wherein said mutation event disrupts the functioning of an assembled ion channel so as to produce one or more disorders associated with ion channel dysfunction, including but not restricted to, hyper- or hypo-kalemic periodic paralysis, myotonias, malignant hyperthermia, myasthenia, cardiac

arrhythmias, episodic ataxia, migraine, Alzheimer's disease, Parkinson's disease, schizophrenia, hyperekplexia, anxiety, depression, phobic obsessive symptoms, neuropathic pain, inflammatory pain, chronic/acute pain, Bartter's syndrome, polycystic kidney disease, Dent's disease, hyperinsulinemic hypoglycemia of infancy, cystic fibrosis, congenital stationary night blindness and total colour-blindness, when expressed in combination with one or more additional mutations or variations in said ion channel subunit genes.

15. (Original) An isolated nucleic acid molecule comprising any one of the nucleotide sequences set forth in SEQ ID NOS: 1-72.

16. (Original) An isolated nucleic acid molecule consisting of any one of the nucleotide sequences set forth in SEQ ID NOS: 1-72.

17. (Original) An isolated nucleic acid molecule encoding a mutant KCNQ2 subunit, wherein the mutation event has occurred in the C-terminal domain of the KCNQ2 subunit and leads to a disturbance in the calmodulin binding affinity of the subunit, so as to produce an epilepsy phenotype.

18. (Original) An isolated nucleic acid molecule as claimed in claim 17 wherein the mutation event has occurred in exon 8, exon 11, exon 14 or exon 15.

19. Cancelled.
20. Cancelled.
21. Cancelled.
22. Cancelled.
23. Cancelled.
24. Cancelled.
25. Cancelled.
26. Cancelled.
27. Cancelled.
28. Cancelled.
29. Cancelled.

30. (Currently Amended) An expression vector comprising a nucleic acid molecule as claimed in ~~any one of claims 8 to 18~~ claim 8.

31. (Original) A cell comprising at least one expression vector as claimed in claim 30.

32. (Original) A cell as claimed in claim 31 comprising two or more expression vectors.

33. (Currently Amended) A cell comprising at least one ion channel type, wherein the or each ion channel type incorporates at least one mutant polypeptide, said polypeptide being a mutant or variant ion channel subunit wherein a mutation event selected from the group consisting of the mutation events set forth in the following Table:

| Subunit Gene | Amino Acid Change |
|---|---|
| SCN1A | R222X |
| SCN1A | W384X |
| SCN1A | A395P |
| SCN1A | F403L |
| SCN1A | Y413N |
| SCN1A | V422E |
| SCN1A | R1407X |
| SCN1A | M1780T |
| SCN1A | R1892X |
| SCN1B | R85H |
| SCN2A | R223Q |
| SCN2A | V892I |
| SCN2A | L1003I |
| SCN2A | T1200A |
| SCN2A | R1319Q |
| CHRNA5 | V134I |
| CHRNA2 | A125T |
| CHRNA3 | R37H |
| KCNQ2 | K69fsX119 |
| KCNQ2 | M1V |
| KCNQ2 | M1T |
| KCNQ2 | R353G |
| KCNQ2 | R430X |
| KCNQ2 | R570S |
| KCNQ2 | L619R |

has occurred.

34. (Original) A cell as claimed in claim 33 comprising ion channels that incorporate two or more mutant polypeptides.

35. (Original) A cell as claimed in claim 33 comprising two or more ion channel types each incorporating one or more mutant polypeptides.

36. (Currently Amended) A method of preparing a polypeptide, comprising the steps of:

(1) culturing cells as claimed in ~~any one of claims 31 to 35~~ claim 31 under conditions effective for polypeptide production; and

(2) harvesting the polypeptide.

37. (Original) A polypeptide prepared by the method of claim 36.

38. Cancelled.
39. Cancelled.
40. Cancelled.
41. Cancelled.
42. Cancelled.
43. Cancelled.
44. Cancelled.
45. Cancelled.
46. Cancelled.
47. Cancelled.
48. Cancelled.
49. Cancelled.
50. Cancelled.
51. Cancelled.
52. Cancelled.
53. Cancelled.
54. Cancelled.
55. Cancelled.
56. Cancelled.
57. Cancelled.
58. Cancelled.
59. Cancelled.
60. Cancelled.
61. Cancelled.
62. Cancelled.
63. Cancelled.
64. Cancelled.
65. Cancelled.
66. Cancelled.
67. Cancelled.

68. Cancelled.
69. Cancelled.
70. Cancelled.
71. Cancelled.
72. Cancelled.
73. Cancelled.
74. Cancelled.
75. Cancelled.
76. Cancelled.
77. Cancelled.
78. Cancelled.
79. Cancelled.
80. Cancelled.
81. Cancelled.
82. Cancelled.
83. Cancelled.
84. Cancelled.
85. Cancelled.

86. (New) A polypeptide encoded by an isolated nucleic acid molecule as claimed in claim 8.